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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,275	04/21/2004	Hul-Chun Hsu	OP-093000008	5428

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HDSL  
4331 STEVENS BATTLE LANE  
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EXAMINER

MCKINNON, TERRELL L

ART UNIT PAPER NUMBER

3753

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/828,275	HSU, HUL-CHUN	
	<b>Examiner</b>	<b>Art Unit</b>	
	Terrell L. Mckinnon	3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2005.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-8 and 12-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-8 and 12-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/21/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-8 and 12-14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mashiko et al. (EP 455 276) in view of Sarraf (U.S. 6,793,009).

Mashiko discloses a wick structure for a heat pipe comprising:

- a wick structure to be attached to an internal wall of a tubular member;
- the tubular member includes an open and close end, and the mesh extends towards an internal bottom surface of the close end;
- a mesh in the form of an elongate circular ring and a plurality of particulates of metal powder and fine broken fibers embedded in interstices of the mesh (See Derwent abstract);
- wherein the mesh and the particulates embedded therein are capable of being attached to the internal wall of the tubular member by a sintering process;

Art Unit: 3753

- a support member disposed in the tubular member to press the wick structure against the internal wall of the tubular member (see Derwent abstract and Fig. 1);
- the tubular member is fabricated from a good thermal conductive metal material;
- the mesh includes a woven mesh, the tubular member has a fusion point higher than that of the wick structure;
- the mesh is fabricated from a thin layer with a plurality of porosities;
- the thin layer includes a plurality of recesses and protrusions;
- the particulates have a fusion point lower than that of the mesh;
- the support member has a fusion point higher than those of the mesh and the particulates;
- the support member includes a plate spiral structure (Fig. 1);
- the support member includes a linear spiral structure; and
- the support member is fabricated from a resilient material.

Mashiko's invention discloses all of the claimed limitations from above except for the structural limitations of the wick extending towards an internal bottom surface of a closed end of a heat pipe.

3. However, Sarraf teaches a tower heat pipe, wherein the wick extending towards an internal bottom surface of a closed end of a heat pipe, and the combination of particles embedded in the interstices of a mesh wick [(column 2; lines 64 through

Art Unit: 3753

column 3; line 5) and (column 3, lines 18-28) and (column 3; line 65 through column 4, line 9)].

Given the teachings of Sarraf, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the a wick structure for a heat pipe of Mashiko with a tower heat pipe, wherein the wick extending towards an internal bottom surface of a closed end of a heat pipe, and the combination of particles embedded in the interstices of a mesh wick.

Doing so would provide an improved heat pipe for efficiently dissipating heat from heat generating devices.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mashiko et al. (EP 455 276) in view of Sarraf (U.S. 6,793,009) as applied to claims above, and further in view of Kosson et al. (U.S. 3,901,311).

Mashiko's invention, as modified by Sarraf, discloses all of the claimed limitations from above except for the support member including a porous plate curled as a roll.

5. However, Kosson teaches the use of the support member includes a porous plate curled as a roll.

Given the teachings of Kosson, it would have been obvious to one of ordinary skill in the art at the time of the invention to further modify the wick structure for a heat pipe of Mashiko with the support member includes a porous plate curled as a roll.

Doing so would provide enhance capillary action for improving the cooling performance of the heat pipe.

Art Unit: 3753

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following references cited on the USPTO 892 discloses related limitations of the applicant's claimed and disclosed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Terrell L. Mckinnon whose telephone number is 571-272-4797. The examiner can normally be reached on Monday -Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Blau can be reached on 571-272-4406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Terrell L Mckinnon  
Primary Examiner  
Art Unit 3753  
January 23, 2006